

REMARKS

Applicants have carefully reviewed the Office Action dated January 15, 2003. Applicants have cancelled Claims 1-2 to more clearly point out the present inventive concept. Reconsideration and favorable action is respectfully requested.

Claims 1-20 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Stroyan*, U.S. Patent No. 6,429,877. This rejection is respectfully traversed.

Applicants present inventive concept, as defined by the amended claims, is directed toward a method for antialiasing edge pixels during a rendering operation of pixels in a graphics engine. Applicants utilize a technique wherein a given edge pixel, once it has been determined to be an edge pixel, is "supersampled" to determine the ones of the subpixels in the supersampled pixel that lie within a polygon within which the "sampling" point of the edge pixel lies, i.e., the background polygon. The other of the subpixels lie outside of the background polygon. A mask is then generated that represents the positional relationship of each of the subpixels within the edge pixel with respect to the edge of the background polygon. Each of the subpixels indicates whether it lies within the background polygon or outside the background polygon. With the use of this mask, a later blending or filtering operation can be performed which allows color from adjacent or neighboring pixels to be blended into the edge pixel. With the use of this mask, the amount of color blended from a neighboring pixel can be more accurately determined due to the knowledge embedded within the mask of the portion of subpixels that actually lie within or lie outside of the background polygon and the portion of the subpixels that lie within the space of a neighboring pixel. When more than one neighboring pixel is to be blended into an edge pixel, the weighting value applied to both blending operations can be achieved with knowledge of such information.

The *Stroyan* reference discloses a system for rendering an edge pixel and, during the rendering operation, determining coverage information for an edge pixel, i.e., how much of the pixel lies within the triangle or polygon associated with its background color. This information is provided in a single byte that will provide both coverage and direction information. The direction information is information that will indicate the relationship of the sampling point to the edge of the polygon. In the disclosed embodiment of

Stroyan, there is only provided top, left, right and bottom. In column 8, lines 11-26, there is disclosed a description of the byte (162) in Figure 5A therein. In this disclosure, it is set forth that blending can occur in four directions, top, left, right and bottom. In the equation in Col. 7, lines 10-13, the blending operation is set forth that as the coverage area of the background multiplied by the background color plus the percentage outside the background multiplied by the color of the adjacent pixel. Therefore, there is disclosed only a single operation for blending color into an edge pixel from a single neighboring pixel that is adjacent or proximate thereto. There is provided more disclosure in Col. 8, beginning at line 17 that indicates the provision of an additional state to allow for additional features. One additional feature is set forth by way of example wherein two or more primitive edges may intersect a single pixel. In this event, *Stroyan* sets forth as follows:

For example, in the special case where two or more primitive edges intercept at a single point, a value of "100" may be encoded in the direction portion of the byte 162. This value may indicate that the current pixel is to be blended with the adjacent pixel colors in all four directions. Other similar special case circumstances may be accommodated with the three additional encoded states. (Col. 8, lines 20-26)

This language seems to indicate that the information stored in the byte 162 can be utilized to blend with more than two pixels. However, there is only disclosure that provides for determining first, the amount or percentage of a given edge pixel that lies within the background triangle or polygon within which the sampling point of the edge pixel lies and, second, the direction from the sampling point or center of the edge pixel to the edge of the background triangle or polygon. Therefore, there will only be a single direction vector provided to one edge of the background triangle or polygon and, therefore, only a single relationship to an adjacent pixel stored therein, i.e., top, left, bottom, right. There can never be two relationships stored and, from the disclosure, it would appear that this single relationship is utilized to blend from up to four directions, but there is no disclosure as to how such blending operation would occur. Therefore, this blending operation, if associated with more than two pixels, would utilize a single relationship to blend from four directions. Without more information as to how much to blend from other than one pixel, there would therefore not be stored or associated with the byte (162) any relationship to more than a single neighbor, that defined by the direction information, which is disclosed as a single vector.

Applicants' independent Claims 3 and 12 both define the antialiasing value as representing the relationship of an edge pixel to "its surrounding neighbors as to the amount of color that is to be blended into the edge pixel of a color corresponding to that of its surrounding neighbors . . ." *Stroyan* does not disclose such an antialiasing value, as the antialiasing value stored in byte (162) of *Stroyan* can only define the relationship of a single adjacent or neighboring pixel and, therefore, only information associated with one neighbor can be blended therein in accordance with the stored relationship. As described herein above, any other blending operation in *Stroyan* is done independent of the relationship to other neighboring pixels. Therefore, Applicants believe that *Stroyan* does not anticipate Claims 3 and 12, as the single direction value and the single coverage value do not, in combination, allow for defining a relationship to more than a single neighboring pixel in the direction of the direction vector. Therefore, Applicants respectfully request the withdrawal of 35 U.S.C. § 102(e) rejection with respect to Claims 3 and 12.

Claims 5 and 14 are directed toward the use of supersampling of the edge pixel during the rendering operation to provide the subpixels. The coverage of the subpixels is converted to a coverage pattern that represents a positional relationship of the coverage as to neighboring pixels. This incorporates more than a single subpixel, since the mask allows such. There is provided therein a pattern, this set forth in Claims 6 and 15. This coverage pattern is believed to be distinguishable over the antialiasing value in *Stroyan* in that there is no pattern but, rather, merely a general coverage number and a direction. Claims 7 and 16 set forth that the antialiasing value constitutes a "map" of the subpixels. Clearly, there is no disclosure or suggestion in *Stroyan* associated with in any way defining a map of the subpixels. Direction information and percent coverage does not constitute a map. As such, Applicants respectfully request withdrawal of the 35 U.S.C. 102(e) rejection with respect to Claims 5-7 and 14-16.

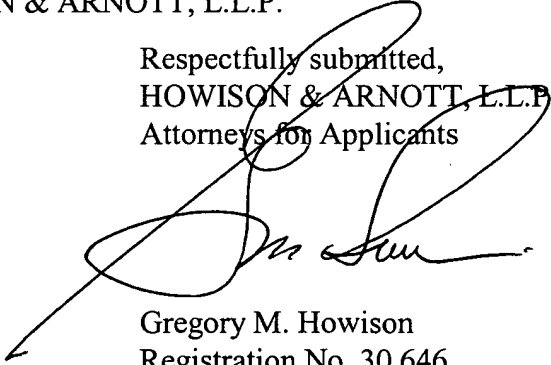
Claims 10 and 19 are directed specifically to the concept that determination of the color is performed on at least two adjacent pixels to the edge pixel. This is performed in accordance with the "positional" relationship of the subpixels and the supersampled edge pixel to the at least two adjacent pixels. Since there is nothing stored in the antialiasing value in the *Stroyan* byte (162) that in any way allows a filtering operation to determine information regarding subpixels, Claims 10 and 19 are believed not to be anticipated or obviated by *Stroyan* and, therefore, the withdrawal of the 35 U.S.C. 102(e) rejection with respect to Claims 10 and 19 is respectfully requested.

Claims 11 and 20 define the creation of the antialiasing value as utilizing a depth value that is created, which depth value constitutes or comprises a depth value of the subpixel that is covered by the foremost polygon. This basically is the secondary depth value Z_s , which is described with respect to Figures 20 and 21. There is no disclosure or suggestion in *Stroyan* to utilize such a secondary depth value for the purpose of rendering the pixel. There is only provided the conventional single depth value and, also, this depth value is not utilized in the rendering operation. Therefore, Applicants respectfully request the withdrawal of the 35 U.S.C. § 102(e) rejection with respect to Claims 11 and 20.

Claims 4 and 13 depend from independent Claims 3 and 9, respectively and, therefore, Applicants respectfully request the withdrawal of the 35 U.S.C. § 102(e) rejection with respect to Claims 4 and 13.

Applicants have now made an earnest attempt in order to place this case in condition for allowance. For the reasons stated above, Applicants respectfully request full allowance of the claims as amended. Please charge any additional fees or deficiencies in fees or credit any overpayment to Deposit Account No. 20-0780/BBOY-25,415 of HOWISON & ARNOTT, L.L.P.

Respectfully submitted,
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